

# COMM-TEC

## MTX series

MTX0404CA

MTX0804CA

MTX0808CA

MTX1616CA

Composite Video and Stereo-Audio Matrix Switcher

User Manual

(English)



**COMM-TEC GmbH**  
Siemensstr. 14  
D-73066 UHINGEN

Tel.: +49-7161-3000-0  
Fax: +49-7161-3000-333

[www.comm-tec.de](http://www.comm-tec.de)

Version A1- December 2006  
© Copyright by COMM-TEC

## Table of Contents

|                                               |    |
|-----------------------------------------------|----|
| 1. Safety Warnings / Precautions .....        | 2  |
| 2. About the Product .....                    | 3  |
| 3. Installation .....                         | 7  |
| 4. Operation .....                            | 8  |
| 5. Specifications .....                       | 11 |
| 6. Warranty, Service and Returns Policy ..... | 12 |

## 1. Safety Warnings / Precautions

Please read this manual carefully before using your Matrix Switcher. It is recommended that you keep this manual handy for future reference. These safety instructions are to ensure the long life of your MTX unit and to prevent fire and shock hazard. Please read them carefully and follow all warnings.

### 1.1 General

- Do not open the cover of the equipment since there are high-voltage components inside creating the risk of electric shock.
- Qualified Comm-Tec service personnel, or authorized representatives must perform all service. Service performed by unauthorized personnel without prior approval will void the warranty.
- Changes or modifications not expressly approved by the manufacturer (responsible for compliance) could void the user's authority to operate the equipment.

### 1.2 Installation

- For best results, place the unit on a flat, level surface in a dry area away from dust and moisture.
- Handle the Matrix Switcher carefully. Dropping or jarring can damage internal components.
- Do not place heavy objects on top of the equipment.
- To prevent fire or shock, do not expose this unit to rain or excessive moisture. Do not place the equipment in direct sunlight, near heaters or heat radiating appliances, or near any liquid. Exposure to direct sunlight, smoke, or steam can harm internal components.
- To turn off the main power, be sure to remove the power cord from the power outlet. The power outlet socket should be installed as near to the equipment as possible and should be easily accessible. Make sure the outlet is properly grounded for safety as per local regulations.
- Do not pull the power cord or any cable that is attached to the equipment.
- If the equipment is not used for an extended period, disconnect the power cord from the outlet to avoid fire, shock, and loss of power.

### 1.3 Safety Guidelines for the Rack-Mounting of the Equipment.

- Never restrict the airflow through the equipments' fan or vents.
- Normal operating ambient temperature is between 40-100 degrees F (5 – 40°C).
- When installing equipment into a rack, distribute the units evenly. It is recommended to leave one space on top and bottom of equipment.
- Connect the unit to a properly rated power circuit (100V - 240V, 50/60Hz).
- Reliable grounding of the Rack-Mounted Equipment should be maintained.

### 1.4 Cleaning

- Unplug the equipment power cord before cleaning. Clean surfaces with a dry cloth. Never use strong detergents or solvents, such as alcohol or thinner. Do not use a wet cloth or water to clean the unit.

**FCC / CE Notice**

- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## 2. About the Product

### 2.1 Function

The MTX series Matrix Switcher is a high-performance pro-AV matrix switcher that is designed for cross switching multiple composite video and audio inputs to multiple outputs. The MTX series switchers are mostly used in presentation rooms, board-rooms, broadcast TV engineering, multi-media meeting rooms, big screen display engineering, television education, command control centers, and many other installations.

COMM-TEC provides a wide range of AV matrix switchers ranging from 4-inputs to 256 and 2-outputs to 256.

### 2.2 Features

All signal connectors are RCA, except for the MTX1616CA, here the Video In- and Outputs are BNC connectors. The MTX Matrix Switchers can be controlled via front panel, with Infrared Remote or RS-232 port.

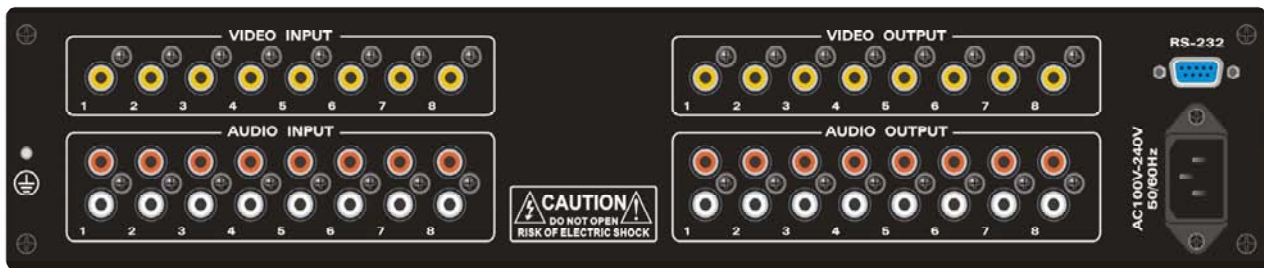
| Model     | Signal connectors    | Video Inputs | Video Outputs | Audio Inputs | Audio Outputs | Unit Height |
|-----------|----------------------|--------------|---------------|--------------|---------------|-------------|
| MTX0404CA | all RCA              | 4            | 4             | 4            | 4             | 1ru         |
| MTX0804CA | all RCA              | 8            | 4             | 8            | 4             | 2ru         |
| MTX0808CA | all RCA              | 8            | 8             | 8            | 8             | 2ru         |
| MTX1616CA | Video BNC, Audio RCA | 16           | 16            | 16           | 16            | 3ru         |

## 2.3 Front Panel



| Button/*Indication         | Function                                                                                                                     |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------|
| COMM-TEC<br>MTX0804CA V2.6 | The LCD-Display shows the entered commands and messages (status, acknowledgement, errors, prompt, matrix model and firmware) |
| 0 - 9                      | Number entry for I/O selection, save and recall of presets                                                                   |
| AV                         | Audio-follows-Video switching                                                                                                |
| VIDEO                      | Break-Away, only Video part is switched                                                                                      |
| AUDIO                      | Break-Away, only Audio part is switched                                                                                      |
| /                          | separates different numbers in one command                                                                                   |
| END                        | Finishes command entry                                                                                                       |
| ENTER                      | Executes command                                                                                                             |
| ALL                        | Option: one input to all outputs, inputs are switched to outputs with the same number or disconnect of all routings          |
| SAVE                       | Saves present configuration in a preset (number entry required)                                                              |
| RECALL                     | Recall of a preset (number entry required)                                                                                   |
| CANCEL                     | Deletes last entry or/and returns to standby status                                                                          |
| STATUS                     | Shows the present Video- and Audioroutings in the LCD display                                                                |
| *THROUGH                   | Inputs are switched to outputs with the same number: 1 to 1, 2 to 2,....                                                     |
| *CLOSE                     | Disconnect all crosspoints/routings                                                                                          |

## 2.4 Back Panel



Rear Panel of 8 x 8 BNC Stereo Audio-Cinch

Depending on the model of the matrix, the video signal I/O interface is made up of 4 or 8 channels on RCA terminals or 16 BNC female terminals. Audio signal I/O terminals are made up of 4, 8 or 16 RCA terminals for each channel (left & right). The channel numbers of the signal I/O terminals start from channel 1 to the maximum number of channels depending on the model. Audio left state terminals are white, audio right state terminals are red RCAs. Please refer to back panel figure for other types of interfaces

The AV matrix switchers have an internal power supply with IEC female connector for power cord. There is a 9pin SubD female connector for RS-232 port. An RJ-11 port (Auxiliary) is for future expansion.

## 2.5 Front Panel and Rear Panel of other MTX CA Models



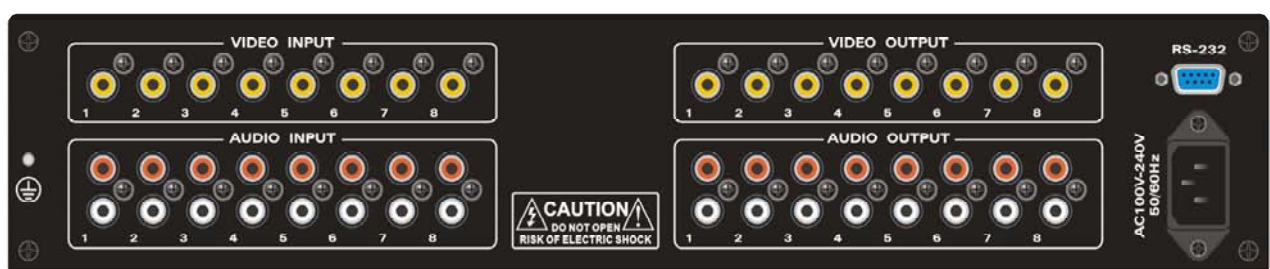
Front Panel of 4x4 (1U)



Rear Panel of 4x4 (1U)



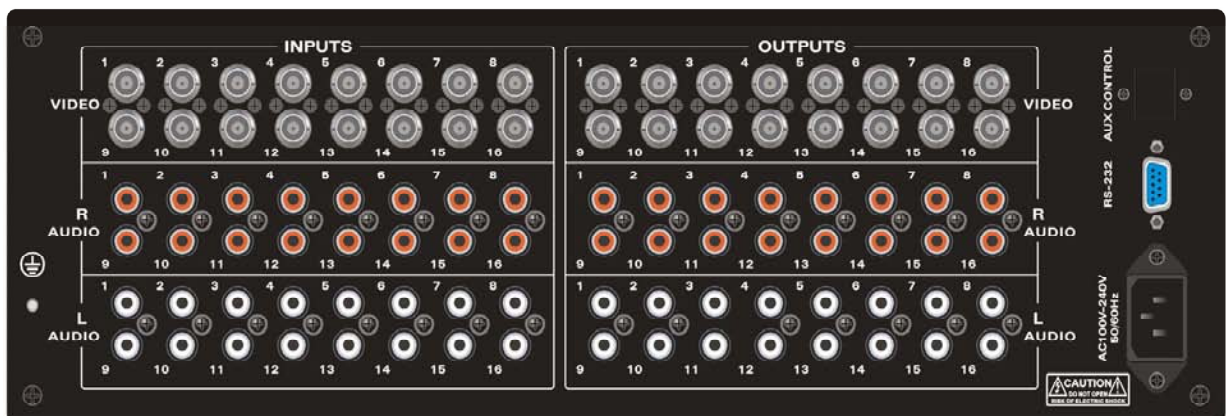
Front Panel of 8x4 and 8x8 (2U)



Back Panel of 8x8 (2U)

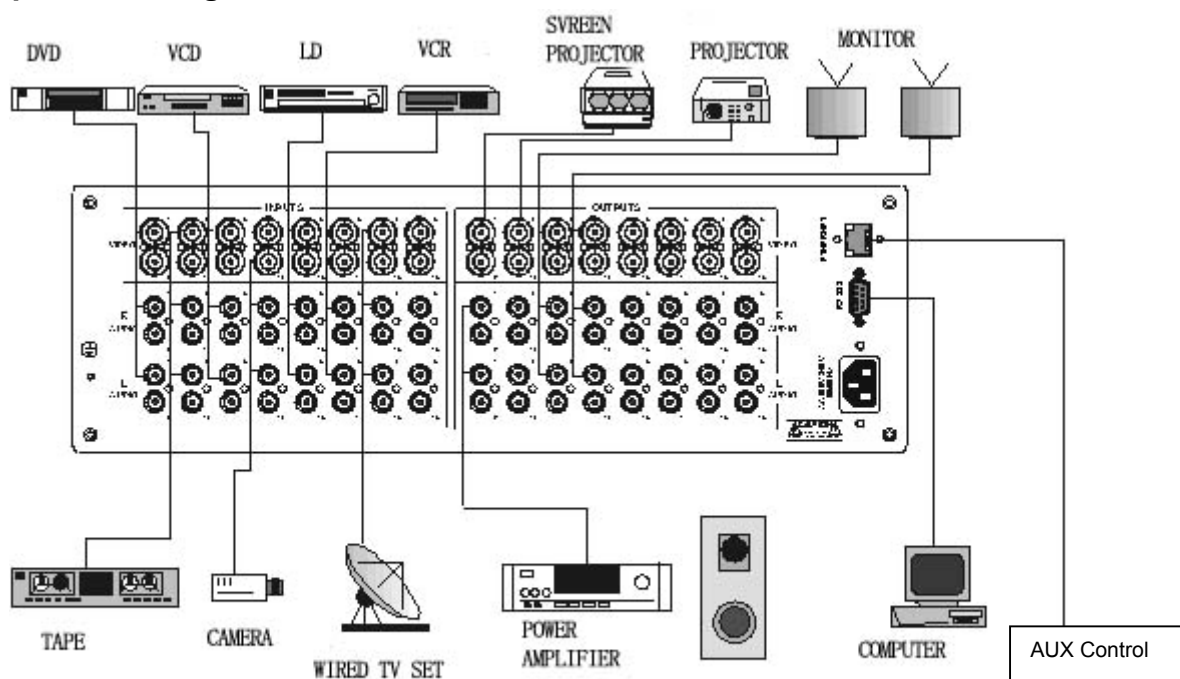


Back Panel of 16x8 and 16x16 (3U)



Back Panel of 16x16 (3U)

## 2.6 Application Diagram



## 3. Installation

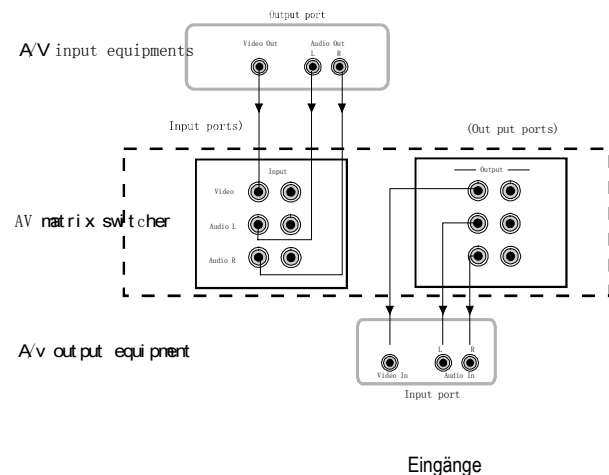
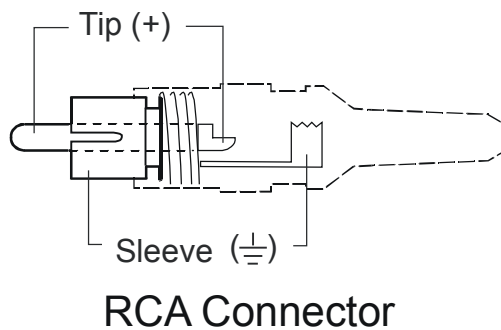
### 3.1 Hardware Installation

The MTX matrix switchers are rack-mountable using the holes in the front panel. Take a set of standard rack screws and secure the unit into the rack. For ideal performance and easy wiring access it is advisable in a 19" rack leave at least 1ru space above and below. Do not place high heat-producing equipment directly above or below the enclosure.

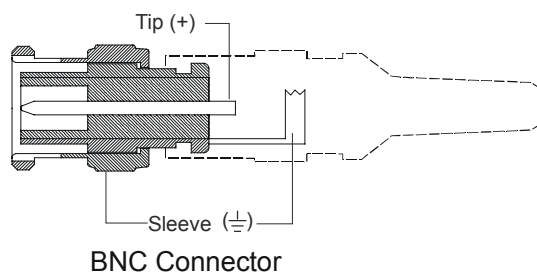
### 3.2 Video Connection

Use good quality 75Ohm coax cable for all video connections. Switch off all units while connecting sources and destinations.

### 3.3 RCA Connection



### 3.4 BNC Connection



### 3.5 Audio Connection

The MTX CA Matrix Switchers can switch unbalanced stereo audio signals. Connect your Audiosources with the RCA terminals indicated with AUDIO INPUTS, and the AUDIO OUTPUTS RCA connectors with your destinations (Amplifier, Recorder, Active Speakers....). Don't mix up the right and left channel of your stereo audio signals.

### 3.6 RS-232 Connection

All functions of the MTX units can be controlled with external controllers like computers or third party controllers (e.g. AMX). A serial controller is any device that is connected to the standard RS-232 serial port (9pin SubD female) on the rear panel and that can send and receive ASCII character format.

The port settings are:

|           |      |
|-----------|------|
| BAUD      | 9600 |
| Data Bits | 8    |
| Stop Bit  | 1    |
| Parity    | NONE |

Connect serial controllers referring to the table below for RS-232 cable connector pin mapping:

| Pin-#. at UP-1280SU<br>RS-232 Port | Description | Pin-# at PC<br>RS-232 Port | Description |
|------------------------------------|-------------|----------------------------|-------------|
| 2                                  | Tx Transmit | 2                          | Rx Receive  |
| 3                                  | Rx Receive  | 3                          | Tx Transmit |
| 5                                  | Gnd Ground  | 5                          | Gnd Ground  |

## 4. Operation

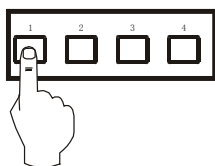
The matrix switchers can be controlled through the front control panel, by infrared remote controller, and via the RS-232 communication port.

### 4.1 Front Panel Operation

Using the front control panel, the switcher can be controlled directly and easily by pressing the buttons using this format:

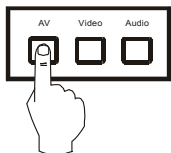
“Input Channel” + “Switching Mode” + “Output Channel” + “End” + “Enter”

#### Example 1 : Transfer video and audio signals from input channel 1 to output channels 3 and 4



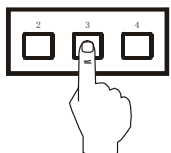
Input Command:  
1

1. Press the button for input channel number “1”.  
Display feedback on LCD: “1”



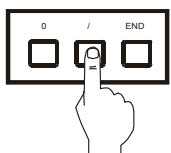
Input Command:  
1B

2. Press the button for switching mode “AV”.  
Display feedback on LCD: “B” (“B” for both audio and video, “A” for audio only; “V” for video only).



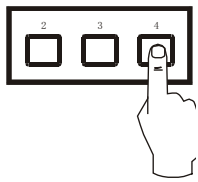
Input Command:  
1B3

3. Press the button for the first output channel number “3”.  
Display feedback on LCD: “3”



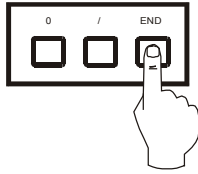
Input Command:  
1B3,

4. Press the break button “/”.  
Display feedback on LCD: “,”



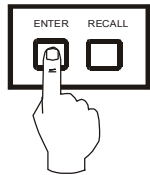
Input Command:  
1B3, 4

5. Press the button for the second output channel number "4".  
Display feedback on LCD: "4"



Input Command:  
1B3, 4.

6. Press the button "END" to finish the command.  
Display feedback on LCD: "."

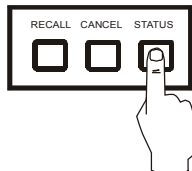
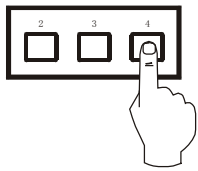


Switch OK!  
AV: 01 -> 004

7. Press the button "ENTER" to perform this command.  
Display feedback on LCD: "Switch OK"

### Example 2: To inquire the status on the output channel No.4

Operation: Press buttons in this order "4", "STATUS"



VIDEO: 3 → 4  
AUDIO: 2 → 4

Feedback in LCD-Display: Videoinput #3 and Audioinput #2 are switched to Output #4.

More switch commands:

„ALL“ + „1“: Routes inputs to outputs with the same number: 1 to 1, 2 to 2,....

„1“ + „ALL“: Routes input #1 to all outputs, <2> <ALL>: Routes Input #2 to all outputs, and so on.

„ALL“ + „2“: Disconnects all routed crosspoints.

„SAVE“ + „0“ to „9“: Saves present configuration as preset under selected number.

„RECALL“ + „0“ to „9“: Recalls saved preset with the selected number.

## 4.2 Remote Controller Operation



The MTX series matrix switcher can be controlled with the infrared remote controller.

Button functions are the same as with front panel. Only the buttons „Through“ and „Close“ have a functions when pressed directly after „ALL“.

The keys <PROGRAM>, <UNDO>, <DEMO> are without function. Attention <LOCK> button: before usage set password with control software. Otherwise front panel can be only unlocked with this software.

For details please refer to **Front Panel Operation**.

### 4.3 RS-232 Operation

Through the RS-232 port located on rear panel one is able to control and operate the AV Matrix remotely.

**Communication protocol:** RS-232, ASCII commands are case sensitive.

**Port Settings:** Baud rate: 9600, Data bit: 8, Stop bit: 1, Parity bit: None

| Functions                                                                  | ASCII Commands and Protocols | Example         | Default          |
|----------------------------------------------------------------------------|------------------------------|-----------------|------------------|
| <b>System Command</b>                                                      |                              |                 |                  |
| Rewrites the password. Must be 8 digits.                                   | /+xxxxxxxx;                  | /+12345678;     | None             |
| Locks the keyboard                                                         | /%Lock;                      | /%Lock;         | Not Locked       |
| Unlocks the keyboard                                                       | /%Unlock;                    | /%Unlock;       | N/A              |
| Turns OFF buzzer                                                           | /:Belloff;                   | /:Belloff;      | Beep ON          |
| Turns ON buzzer                                                            | /:Bellon;                    | /:Bellon;       | N/A              |
| Sets the delay time for background light in minutes.<br>Range: 001 to 240. | /%Backlightxxx;              | /%Backlight005; | 30 min.          |
| <b>Operation/Control Command</b>                                           |                              |                 |                  |
| Connects input "x" to ALL output channels.                                 | xAll.                        | 3All.           | N/A              |
| Connects the video signal from input "x" to the matching output.           | x#.                          | 4#.             | Not Connected    |
| Connects ALL input signals to the matching output channels.                | All#.                        | All#.           | N/A              |
| Switches OFF ALL the output channels.                                      | All\$.                       | All\$.          | All ON.          |
| Switches OFF output "y".                                                   | y\$.                         | 2\$.            | N/A              |
| Connects video from input "x" to output "y".                               | xVy.                         | 2V3.            | N/A              |
| Connects video from input "x" to outputs "y, y2, y3".                      | xVy,y2,y3.                   | 1V3,4,5.        | N/A              |
| Connects audio from input "x" to output "y".                               | xAy.                         | 2A4.            | N/A              |
| Connects audio from input "x" to outputs "y, y2, y3".                      | xAy,y2,y3.                   | 1A2,3,4.        | N/A              |
| Connects video and audio from input "x" to output "y".                     | xBy.                         | 3B5.            | N/A              |
| Connects video and audio from input "x" to outputs "y, y2, y3".            | xBy,y2,y3.                   | 2B4,5,6.        | N/A              |
| Connects input "x" to ALL outputs in group "g".                            | xPg.                         | 1P1.            | N/A              |
| Groups the outputs "y, y2, and y3" under the group "x".                    | gPPy,y2,y3.                  | 2PP1,2,3.       | N/A              |
| Saves configuration to the preset "y". "y" ranges from 0 to 9.             | Savey.                       | Save9.          | All Available    |
| Recalls the preset command "y".                                            | Recally.                     | Recall7.        | N/A              |
| Clears the preset command "y".                                             | Cleary.                      | Clear5.         | N/A              |
| <b>Feedback/Status Command</b>                                             |                              |                 |                  |
| Displays the outputs channels in Group "g".                                | Sg.                          | S2.             | N/A              |
| Displays the input channel of output "y".                                  | Statusy.                     | Status4.        | N/A              |
| Displays the inputs to the connected outputs one by one.                   | Status.                      | Status.         | N/A              |
| Displays the product information.                                          | /*Type;                      | /*Type;         | Varies per model |
| Displays Software Version                                                  | /^Version;                   | /^Version;      | V2.z             |
| Displays COM port feedback information.                                    | /:MessageOn;                 | /:MessageOn;    | N/A              |

## 5. Specifications

| Model                               | MTX0404CA                                                                                    | MTX0804CA<br>MTX0808CA | MTX1616CA                 |
|-------------------------------------|----------------------------------------------------------------------------------------------|------------------------|---------------------------|
| <b>Specifications</b>               |                                                                                              |                        |                           |
| <b>Video</b>                        |                                                                                              |                        |                           |
| Bandwidth                           | 150MHz (-3dB) , fully loaded<br>0 -10MHz:≤+/- 0.1dB<br>0 -30MHz:≤+/- 0.5dB                   |                        |                           |
| Cross talk sum                      | -50dB @ 5 MHz, -45dB @ 10 MHz                                                                |                        |                           |
| Differential phase error            | 0.03 Deg.                                                                                    |                        |                           |
| Differential gain error             | 0.1°, 0.01%                                                                                  |                        |                           |
| Switching speed                     | 200 ns (Max)                                                                                 |                        |                           |
| Signal type                         | Composite Video                                                                              |                        |                           |
| <b>Video Input</b>                  |                                                                                              |                        |                           |
| Connector                           | RCA                                                                                          | RCA                    | BNC female                |
| Maximum/Minimum level               | Analog signals: 0.5V ~ 2.0V p-p                                                              |                        |                           |
| Impedance                           | 75 Ω                                                                                         |                        |                           |
| <b>Video Output</b>                 |                                                                                              |                        |                           |
| Connector                           | RCA                                                                                          | RCA                    | BNC female                |
| Maximum/Minimum level               | 2.0V p-p                                                                                     |                        |                           |
| Impedance                           | 75 Ω                                                                                         |                        |                           |
| Gain                                | 1.03 dB                                                                                      |                        |                           |
| DC offset                           | ±5mV (Maximum)                                                                               |                        |                           |
| Transition type                     | Vertical interval                                                                            |                        |                           |
| <b>Sync signal</b>                  |                                                                                              |                        |                           |
| Input/output signals                | NTSC 3.58 , NTSC 4.43 , PAL , SECAM                                                          |                        |                           |
| <b>Audio signal</b>                 |                                                                                              |                        |                           |
| Input connector                     | RCA                                                                                          | RCA                    | 3.8mm with screw , 5 pole |
| Output connector                    | RCA                                                                                          | RCA                    | 3.8mm with screw , 5 pole |
| Gain                                | 0dB                                                                                          |                        |                           |
| Frequency respond                   | 20 Hz ~ 20 kHz,                                                                              |                        |                           |
| General harmonic distortion + noise | 0.03% @ 1 kHz (under rating voltage)                                                         |                        |                           |
| S/N                                 | >90dB                                                                                        |                        |                           |
| Segregation rate                    | >80dB @ 1 kHz                                                                                |                        |                           |
| Y/C interferer                      | <-80dB @ 1 kHz, fully loaded                                                                 |                        |                           |
| CMRR                                | >75dB @: 20 Hz ~ 20 kHz                                                                      |                        |                           |
| Signal                              | Stereo , balanced /unbalanced                                                                |                        |                           |
| Impedance                           | Input : >10 kΩ ( balanced /unbalanced )<br>Output : 50 Ω ( unbalanced ) , 100 Ω ( balanced ) |                        |                           |
| Maximum input level                 | +19.5dBu, ( balanced /unbalanced )                                                           |                        |                           |
| Gain error                          | ±0.1dB @20 Hz ~ 20 kHz                                                                       |                        |                           |
| Max output level                    | +19.5dBu, ( balanced /unbalanced )                                                           |                        |                           |
| <b>Control type</b>                 |                                                                                              |                        |                           |
| Serial control port                 | RS-232, 9-pin FD connector                                                                   |                        |                           |
| Baud rate and protocol              | Baud rate: 9600 Data bit: 8 Stop bit: 1 Parity bit: none                                     |                        |                           |
| Serial port pin-out                 | 2 = TX, 3 = RX, 5 = GND                                                                      |                        |                           |
| Command / Protocol                  | Simple ASCII Commands (Case-sensitive)                                                       |                        |                           |

| Model               | MTX0404CA                                                       | MTX0804CA<br>MTX0808CA | MTX1616CA       |
|---------------------|-----------------------------------------------------------------|------------------------|-----------------|
| Specifications      |                                                                 |                        |                 |
| Features            |                                                                 |                        |                 |
| Power supply        | 100VAC ~ 240VAC, 50/60 Hz, universal international power supply |                        |                 |
| Temperature         | Storing and operating temperature: 5° to + 40°C                 |                        |                 |
| Humidity            | Storing and operating humidity: 10% ~ 90%, non-condensing       |                        |                 |
| Size<br>(W x D x H) | 19"x244x44 mm                                                   | 19"x241x89 mm          | 19"x 245x132 mm |
| Weight              | 2,0 kg                                                          | 3,4 kg                 | 6,4 kg          |
| MTBF                | 30.000 hours                                                    |                        |                 |
| Warranty            | 2 years                                                         |                        |                 |

## 6. Warranty, Service and Returns Policy

This product is under warranty for a period of two (2) years from the date of purchase.

COMM-TEC's liability and Buyer's remedies under this warranty shall be limited solely to repair of the faulty units free of charge.

This warranty does not apply if the product has been modified, repaired by an unauthorized agent, or improperly installed, used, or maintained.

If a problem occurs first contact your dealer or COMM-TEC for trouble shooting.

If verification of a problem requires factory repair, ask COMM-TEC's Customer Equipment Service representative to issue a

### Return Materials Authorization (RMA) number.

Merchandise will not be accepted without a RMA number.

When returning a product to COMM-TEC in Udingen for repair please comply with the following instructions:

- Shipping and insurance costs must be prepaid
- Use original shipping container(s), (if possible)
- Indicate the RMA number clearly on the outside of each container
- Enclose a written description of the problem

The under warranty repaired units will be returned Carriage Free to the sending party (dealer or consumer).

Outside the warranty period, COMM-TEC will repair the faulty units, charging all arising expenses of the repair e.g. labor, parts, transportation and insurance, to the sending party (dealer or consumer).

**For any problems during installation and operation of a MTX series unit  
call the COMM-TEC hotline +49 07161 3000-0,  
send a fax +49 07161 3000-333  
or e-mail to [info@comm-tec.de](mailto:info@comm-tec.de)**